

PACKARD, (J. H.)

SUPRAPUBIC CYSTOTOMY

FOR PURPOSES OTHER THAN

THE EXTRACTION OF CALCULUS.

BY

JOHN H. PACKARD, A.M., M.D.,

SURGEON TO THE PENNSYLVANIA HOSPITAL AND TO ST. JOSEPH'S HOSPITAL, PHILADELPHIA.

REPRINTED FROM THE

TRANSACTIONS OF THE AMERICAN SURGICAL ASSOCIATION,

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So far as appears from the records, Nicholas Franco, of Lausanne, was the first surgeon who obtained access to the urinary bladder by an incision made above the pubes. His operation was performed in 1560, for the removal of a calculus; and although it was successful, he is quoted as advising others not to follow his example. The history of the suprapubic section, for the three centuries and a quarter from that time to the present, is as curious as it is interesting.

Soon after Franco's publication (in 1580), Rousset claimed to have discovered this method, in ignorance that any one had preceded him. Again, in 1719, it was rediscovered by Douglas, who, in turn, said he had known nothing of Rousset's invention. Douglas, somewhat extravagantly, says he "found innumerable instances, in authentic authors and army surgeons, of accidental wounds of the bladder being perfectly cured."¹ Yet it does not seem to have occurred to him that access to the bladder by this route might be made available for any other purpose than the removal of stone.

Proby, in 1700, had given an account of a case met with by him in 1694, in which he had extracted a bodkin from the bladder of a young woman by incision above the pubes; but this was very analogous to a case of stone.

¹ Lithotomia Douglassiana, 1720.

For whatever purpose intended, however, the suprapubic section of the bladder has been, until very recent times, regarded by most surgeons with a species of superstition, and my impression is that in schools and by private instructors it has either been wholly passed over, or mentioned only with disfavor. During my own pupilage at the University of Pennsylvania, from 1850 to 1853, I do not think I ever heard any reference made to it; nor was my attention ever called to it as a thing to be done, until its performance in a case of stone by the late Dr. H. Lenox Hodge, extraction by the perineal wound having been found impossible. This was in 1874; the affair was much discussed by other surgeons of Philadelphia, and the procedure was generally condemned as a desperate and even foolhardy venture. My opinion now is that it was eminently proper, and that the only mistake made was in not adopting it in the first instance.

In November, 1883, I was called in consultation with Dr. Donnel Hughes in the case of a man who had a large piece (five inches long) of a shawl-pin in his bladder. I advised its removal through an opening above the pubes; and the ease of this operation, as well as of the after-treatment, and the prompt recovery of the patient, impressed me greatly. Since that time I have had occasion to reach the bladder by this route in a number of cases, some of which will be presently detailed. This experience has led me to inquire into that of others, and my conviction now is that there is a weight of evidence in favor of such procedures, which must make it a matter of surprise that they are still looked upon so much askance by the great body of surgeons, and, indeed, are unknown to so many. That it is so, let me adduce two proofs:

A writer in the *British Medical Journal* of January 2, 1886, asks for

“The best way to use cocaine in a case of enlarged prostate, necessitating the use of the catheter nearly every hour. There are also great bearing-down pain and prolapse of the rectum. The patient is seventy-six years old. As he lives in the country, he will have to apply it himself. I would be thankful for any suggestion that would benefit

the patient, as he has had all the ordinary remedies, and nothing seems to have benefited him except morphine suppositories."

Some very similar cases, wholly relieved by suprapubic section, will be presently given.

Again, a deservedly prominent surgeon and teacher has lately expressed the opinion, after speaking of the perineal and suprapubic sections into the bladder, that "extended experience alone will suffice to indicate clearly which should be regarded as preferable in the ordinary run of cases." He states further that the suprapubic operation has "disadvantages," but does not specify them.

I do not wish to appear as an advocate of the suprapubic section as against all other methods of access to the bladder; but simply to discuss the question whether or not the objections which have prevailed to place it in the background, are shown by reason or by experience to be well founded. In so doing, it will be my endeavor to avoid bringing in the matter of hypogastric lithotomy, which has been so ably and so thoroughly handled by Dulles, of Philadelphia, and by others; but it will not be easy to leave it wholly aside.

With regard to any proposed surgical procedure, the questions which must arise are:

How far is it free from risk in itself?

How fully does it effect the object in view?

What are the difficulties attending its performance?

And in comparing any procedure with others having the same end, the same questions must arise, but in the comparative form:

Is it more, or less safe?

Is it better calculated, or not so well, to effect the desired object?

Is it easier of performance, or more difficult?

In the present paper, as before said, my purpose is rather to inquire into the correctness of the prejudice, or neglect, under which the suprapubic section has been allowed to lie. I shall not undertake a comparison of this procedure with the other

methods of entering the bladder, unless incidentally and in reference to certain points; the questions above stated will therefore be considered only in their first form.

Now there are certain severe tests to which operative procedures may sometimes be subjected.

One is, the resort to them under very unfavorable circumstances: as by the patient himself; by ignorant persons; by surgeons, with rude or inadequate appliances; or when accident does roughly what the surgeon would do with care. If the results of such cases are found to be good, the fact constitutes a strong argument in favor of the value of any such procedure as a surgical resource.

Another is, the resort to them in especially severe or difficult cases. A method or an operation, which in a great emergency is more available than those in common use, must have something to recommend it when the stress is less urgent.

The penetration of the bladder by the suprapubic route has been thus tested, according to the records.

Carpue quotes from Rousset the history of a citizen of Orleans who, in 1560, was stabbed in the belly with a broad dagger; his urine for nineteen days and nights flowed through the wound, which healed easily after a catheter was passed through the urethra.

Also the case of a man named Conrad, who, in 1558, had a ball shot into his body. It was extracted, with a quantity of calcareous matter; urine passed by the wound for twelve weeks.

Also a wound of the bladder by a bull's horn, and another by a broad-sword; both of which did well.

Gross mentions the classical case of Jean de Dot, who, in the seventeenth century, cut himself in the linea alba, and extracted a stone the size of a hen's egg from his bladder. He also quotes from Fodéré a case in which a man "plunged a knife above the pubes into the viscus [bladder] to relieve a painful retention of urine. The peritoneum was not injured, and recovery ensued." (I did not succeed in finding this account in the only edition of Fodéré to which I have had access.)

Treves and Sexton have each reported a case similar to the preceding; both occurred in sailors at sea, and no ill consequence ensued in either.

As to the resort to suprapubic section in urgent cases, I need only mention here the many instances on record of the extraction, by this method, of calculi too large for removal through the perineum; but shall have occasion later to cite other evidence of the kind, some of it from my own individual experience.

Permit me now to cite the opinions of authors as to the hypogastric operation in general, exclusive of its use as a method of lithotomy; then to see what the anatomists have to say about the region concerned; and next to test these views by the records of cases. I will then venture to state my own experience; and, finally, will offer some remarks upon the methods of procedure.

To begin, then, with the opinions of surgical writers in regard to the suprapubic section, from the time when the first formal statement was made as to its employment in cases of retention of urine. Here, as well as in the subsequent citation of recorded cases, it has seemed to me best to follow a chronological order, and not to group the opinions or the experience as for or against the operation. Nor have I separated the different procedures—aspersion, puncture, or section. My object is to consider rather the route than the special method; to see whether peculiar dangers or difficulties attend the entrance into the bladder through the portion of its anterior wall uncovered by peritoneum.

Dionis, speaking of the high operation for stone, says:

“I do not consider this operation so dangerous as one might imagine; on the contrary, I think it involves less risk than either the greater or the lesser apparatus; the duplicature of the peritoneum, in which the ancients placed the bladder, does not exist, as I have shown in my published *Anatomy*; the bladder is situated outside of the peritoneum, so that it can be opened without touching the membrane, or encroaching upon the cavity of the lower belly.”

Sharp, in 1761, was, as before mentioned, the first author of note, so far as I know, to speak of the suprapubic puncture for drawing off the urine. He says:

“This method has been occasionally followed by some eminent surgeons for many years, and is still approved of, but it is not recommended as having those superior advantages which, in my opinion, belong to it. It is an operation of no difficulty to the surgeon, and of little pain to the patient, the violence done to the bladder being at a distance from the parts affected; it is equally applicable whether the disorder be in the urethra or the prostate gland.”

He then goes on to discuss the proper length of the canula to be left in the bladder, which he thinks should be two or two and a half inches; and the proper point for the puncture one and a half inches above the pubes.

Lawrence Heister says:

“Lastly, there is still another and most ready method of performing the operation according to the high operation, in which the trocar is passed into the anterior part of the bladder immediately above the juncture of the ossa pubis, where the incision is made for the stone in the high operation. Here the bodkin being extracted, and the urine discharged by the canula, the latter is to be secured in the wound by a bandage fastened round the body, that the urine may be retained or discharged at pleasure, until the cause of the suppression be removed; after which the wound may be healed by the bals. capiv. covered with lint and a plaster. Though this operation is but seldom performed by surgeons in a suppression of urine, I must needs declare it, in my opinion, to be very necessary and convenient, where nothing extraordinary forbids, since it is also recommended by Rossetus, Riolan, and Tolet; and since it appears from anatomical experiments that the bladder may be thus safely perforated, when distended with wind or water, without incurring any dangerous symptoms. And accordingly we find it has been put in practice to a good purpose by Turbier, Mery, Douglas, and Middleton; which two last recommend this method of perforating the bladder to be more safe and easy than that in the perineum. We have an instance of the success of this operation given us by Werlhoff; but here the surgeon did not use the triangular bodkin or trocar. He first divided the integuments with a scalpel, and then

perforated the bladder near its neck with a large-sized lancet; after discharging the urine, he introduced a tube, and secured it in the wound for nine days. And thus the patient was happily cured.

“When the cause of the disorder cannot be removed, in a person advanced in years, and when it proceeds from a callus formed from some fistula in the urethra, a scirrhous of the prostate, a large stone, a palsy of the bladder, or some other obstinate malady; in such cases the patient should constantly keep a silver pipe in his bladder as long as he lives, made with a valve and screw to open and shut, that his urine may not come away incessantly, but when the patient desires it.”

Frère Côme, after discussing hypogastric lithotomy, speaks of puncture of the bladder for the evacuation of urine; he mentions the danger of wounding the opposite wall of the viscus, and recommends a curved canula described in 1751, by the use of which, he states, several lives had been saved. It seems to have been a segment of an exact circle.

A case in point is then given, which occurred in 1776.

John Hunter, who died in 1793, spoke very favorably of the suprapubic puncture of the bladder, except where the patient is very fat, or the bladder greatly contracted. He does not refer to any dangers, but only to difficulty in the performance of the operation.

Weldon, in 1793, speaking of the different methods of puncturing the bladder, thinks that each one has its advantages. In the suprapubic, he regards the peritoneum as the only important structure endangered. He thinks that in corpulent subjects the bladder may not always be easily felt; and would prefer the anal operation if the natural passage is not likely to be easily restored.

Dorsey, in 1813, speaks very highly of tapping the bladder above the pubes for retention, and quotes John Bell as saying that, as in strangulated hernia, *delay is the greatest danger*.

Howship, in 1816, merely mentions the suprapubic procedure, and says the rectal is “infinitely superior to either of the other methods.”

Abernethy, in 1822, says:

"All the experience I have had has tended to convince me that the puncture above the os pubis is an innoxious and ready mode of discharging the urine when it cannot be discharged by the natural passages."

Sir Charles Bell, also in 1822, seems to think all the operations equally good.

Sir A. Cooper, in 1823, in a lecture, said that he had seen quite enough of the suprapubic operation, but gives no reason except that a Frenchman once exposed the intestine in performing it.

In 1827, Ducamp describes this procedure as easily performed, attended with little pain, and preferable to either of the other methods of section.

Ségalas, in 1828, says that he had himself never yet found it "needful to adopt the extreme means, puncture of the bladder." But he gives the preference to the hypogastric method if any is demanded.

In 1832, Phillips says that the peritoneum is much more apt to be wounded in the recto-vesical operation, where we must trust to the finger as a guide, than in the suprapubic, where we have ocular demonstration. He says that in the latter method there is less irritation, and that the canula causes less inconvenience; and pronounces it "more certain, more easy, more convenient, and less dangerous."

Amussat, in the same year, speaks very favorably of the method.

Brodie agrees with the opinion of Weldon, before quoted.

Guthrie, in 1834, positively objects to all forms of puncture; he says:

"The operation above the pubes is dangerous, inasmuch as an extravasation of urine may readily take place after it, and lead to the formation of matter and other evils of serious magnitude; it should never, therefore, be had recourse to in cases of retention from stricture."

Parrish, in 1836, speaks very decidedly in favor of the tapping of the bladder above the pubes, from his own experience as well as from that of his preceptor, the eminent Dr. Caspar Wistar. Cases in their practice are elsewhere quoted.

Malgaigne, in 1854, is said to have used these words: "puncture of the bladder is an operation as simple and as innocent as puncture of the peritoneum in ascites." The reporter, M. Vangaver, quotes Malgaigne as especially in favor of puncture (suprapubic) in cases where the urethra is closed after instrumentation.

Dr. F. H. Hamilton, in 1872, after describing the suprapubic operation, says:

"The operation through the rectum is more easily performed and is comparatively safe, and ought always to be preferred unless some condition of the rectum or of the prostate should seem to render it unsuitable."

Gouley, in 1873, speaking of the suprapubic puncture, says:

"This mode of relieving retention of urine has proved very efficient, by giving time for the subsidence of congestive swelling in the prostate and in the vicinity of strictures of the urethra, so that in a few days the canal has become pervious to instruments. The punctures have healed readily in all the reported cases, and perforation of the peritoneum, and even of a loop of intestine, has not been followed by any untoward result."

Gross, in 1876, says:

"Puncture of the bladder above the pubes has generally been regarded as even more objectionable than by any other route, not because of any particular difficulty in the operation, but because of its greater liability, as has been conjectured, to be followed by an escape of urine into the peritoneal cavity and the surrounding connective tissue. Both events are to be dreaded, especially the former, which is almost certainly fatal in from thirty-six to forty-eight hours from its occurrence."

He goes on to say that it is indicated "in cases in which an artificial outlet for the urine is desirable for a long period."

"When the obstruction to micturition is complete, and the capacity of the bladder is greatly diminished, so that a resort to the catheter becomes necessary nearly every hour, rendering the condition of the patient one of extreme misery, with rapid failure of the strength, the permanent retention of a tube in the bladder above the pubes may be advisable to avert impending death. An opportunity is thus afforded to the water to drain off almost as fast as it is secreted, and the bladder, placed in an easy, quiet state, is prevented from constantly contracting on its contents."

Bryant, in 1879, expresses the opinion that in safety and efficiency the suprapubic puncture is not to be compared with that by the rectum. In his last edition (1885), however, he says that in cases of tumor the section above the pubes may be preferable in some cases, as "when the growth is at the fundus, or very large."

Teevan, in 1880, says that the special risk of the hypogastric puncture is urinary infiltration, causing peritonitis.

Mr. T. Smith, in 1881, speaks very favorably of the operation, from a large experience with it. His cases I have quoted elsewhere in this paper.

Spence, in 1882, says: "The operation is not a satisfactory one; it is attended with some danger, and there are few who would consider it comfortable to be compelled to micturate through the front of the abdomen." He thinks a catheter can always be passed, by care and perseverance.

Sir H. Thompson, in 1883, after describing several modes of opening the bladder by the suprapubic route, expressed the opinion that the perineal opening "bids fair to be on the whole more useful, and more generally available in most of the instances in which efficient surgical relief is demanded."

Mr. Edmund Owen, in 1885, says with reference to the operations for stone in children:

"If a young surgeon did not consider himself competent to undertake the ordinary English operation (lateral lithotomy), he could hardly be trusted to resort to the high operation, even with protection of spray and gauze."

This expression would seem to indicate that the writer looked upon the suprapubic section as the more difficult procedure of the two; an opinion which can scarcely have been based upon practical experience in this matter.

M. Drouineau, at the French Surgical Congress in the same year, is reported to have said :

“ In cases of retention of urine complicated by false passage, hypogastric puncture of the bladder should be done immediately, in preference to recto-vesical puncture. In two cases I have subsequently had no difficulty in catheterism. In certain troublesome cases, one might then practise hypogastric puncture first, and afterward catheterism, rendered thereby easier.”

Erichsen, in 1885, says that the suprapubic operation can very seldom be required in enlarged prostate; but in speaking of stricture he refers to it as “undoubtedly easy of performance, and sufficiently safe, though not free from the danger of infiltration of urine into the tissues around the puncture, and the inconvenience of a fistula being left.”

Kapteijn, a Dutch surgeon, is quoted in the *Lancet*, in 1885, as advocating suprapubic aspiration in cases of retention.

In 1886, Professor Chiene says that in retention of urine from the superaddition of acute inflammation with spasm to an old organic stricture,

“ If after a fair trial with instruments he [the surgeon] fails to relieve the retention, he should aspirate above the pubes, continue the use of fomentations and sedatives, and on the following day he will find either that the retention is relieved, or that he is now able to pass an instrument along the urethra into the bladder.”

But he says further: “Repeated aspirations in bad cases of stricture with retention are not, however, to be recommended.” In such cases he regards perineal section as preferable.

Professor J. Greig Smith, speaking of the exploration of the bladder, and the removal of tumors, etc., says that he is convinced by his experience

“that in the matters of affording greater facility in diagnosis, more freedom in operating, and fuller potentiality of extending the opera-

tion to removal of portions of the bladder, the suprapubic is by far the superior surgical method."

Professor Konig, at the Fifteenth Congress of the German Society of Surgery, in 1886, expressed an opinion, which I may be allowed to quote here, although he referred to cases of calculus only :

"With regard to the high and perineal operations for removal of stone, it is stated that, whilst the risks of bleeding in the two procedures are about equal, the latter is almost quite free from danger to life, whilst the former, both from its anatomical conditions and from the risk of septic phlegmon of the anterior abdominal wall, is by no means a safe operation."

Mr. G. Buckston Browne, in a recent communication, refers to his statement in Heath's *Dictionary of Surgery*, that "fatal extravasation and abscess have been known to follow a second aspiration," and mentions Treves's case, reported in 1880. He thinks repeated aspiration bad; but would substitute puncture with a trocar and canula, the latter to remain. He thinks aspiration would certainly be bad in the case of a "rotten" bladder.

I desire next to ask your attention to the expressed views of leading authorities as to the anatomy of the hypogastric region, as concerned in this operation. And I may remark that it is one of the evidences of the slight heed paid to everyday things, that, although these parts are continually exposed, and even examined in autopsies, there is little exact knowledge of them.

The essential point of this inquiry is, of course, the relation of the peritoneum to the bladder-wall and to the parietes of the abdomen. If the risk of wounding the peritoneum is real and constant, it is not, even in these days of abdominal surgery, to be lightly encountered.

By way of further proof that such an inquiry is not superfluous, let me state that in the fifth edition of the well-known and elaborate *System of Practical Surgery*, of the late Sir W. Fergusson, there are two cuts, made by one of the most accomplished of anatomical artists. In one (Fig. 425, p. 689) the

suprapubic portion of the bladder is represented as affording abundant room for puncture or incision between the symphysis and the reflection of the peritoneum. In the other (Fig. 459, p. 728), where the bladder is supposed to be equally distended, the reflection of peritoneum is represented as almost in contact with the symphysis.

French anatomists have paid more attention to this matter than have those of any other country; and their views will appear from the following extracts:

Malgaigne (*Anat. Chir.*, tome ii. p. 477) says that when the bladder is full,

“it rises up largely above the symphysis pubis, and applies itself against the anterior wall of the abdomen, pushing the peritoneum upward, an essential circumstance upon which are based hypogastric cystotomy and lithotomy. But, which it is not less essential to say, in proportion as the bladder rises, its fundus departs from the abdominal wall, and between the two there descends a fold of peritoneum which it is important to avoid wounding. Many surgeons, misled by the commonly received notion that the peritoneum never descends upon the anterior face of the bladder, imagine that it is sufficient to stretch this wall by means of the *sonde-à-dard*, or ordinary sound, to divide it safely. Nothing is more imprudent than such a course; and in a recent *concours*, in which hypogastric lithotomy had to be practised on the dead subject, most of the candidates, trusting to the sound, wounded the peritoneum. Frère Côme, and Souberbielle, great lovers of the sound, added, however, a precaution infinitely more valuable, which, for my part, I hold to insure safety; it consists in carrying the finger along the anterior face of the bladder, and curving it, to push upward the fold of peritoneum, which is only connected with the bladder by loose and easily torn cellular tissue.”

Tillaux (*Traité d'Anatomie Topographique*, p. 841) discusses the whole question with his usual clearness and vigor. He dwells particularly on the importance of what he calls the “antevesical cavity,” the mass of loose areolar tissue in front of the bladder, between it and the symphysis, and then goes on as follows:

“What is the relation of the peritoneum to the anterior face of the bladder?”

“Let it be remembered that the urachus is fixed to the apex of the bladder, and that when the organ is empty, the peritoneum, reflected over this cord, passes directly over the posterior face of the bladder, in such a way that the anterior face is completely bare of it. It is generally taught that the bladder, in mounting up in the abdomen, pushes the peritoneum up above it, and comes to put itself *in its whole altitude* directly in contact by its anterior face with the abdominal wall, no serous membrane intervening between them.

“Several anatomists, Malgaigne in particular, have contested this view, but M. Sappey, above all, has shown the incorrectness of this description. He has demonstrated that a portion of the anterior face of the distended bladder is covered by peritoneum; he has also pointed out that the bladder becomes distended mainly at the expense of its posterior face, and that it there undergoes a tipping movement, by which its apex is inclined forward.

“These are the exact facts: As the bladder rises, it does form a cul-de-sac of peritoneum between its anterior face and the abdominal wall; but I [Tillaux] cannot admit the mechanism ascribed to it by Sappey, and still less the deductions he draws in regard to operative measures.

“M. Sappey says: ‘The peritoneum descends on the anterior face of the viscus in pushing back (*rabattant*) the urachus against this, and it descends the more as the dilatation becomes more marked;’ and further, ‘such is the mechanism in virtue of which the peritoneum drops between the abdominal wall and the bladder.’

“No, the peritoneum does not descend; on the contrary, it rises. In swelling upward, the bladder carries with it the portion of peritoneum situated just above the pubes. In proportion as the bladder expands, its summit widens, so as to offer almost a superior face; and the part of the bladder situated in front of the urachus covers itself with this portion of the peritoneum detached from the abdominal wall; the more the bladder expands, the more peritoneum there is detached from the abdominal wall, and the more of the bladder covered with it. When M. Sappey says, ‘the cul-de-sac descends lower in proportion as the dilatation becomes more considerable,’ the fact is so, but it is equally true that the height to which the bladder is stripped of peritoneum depends on (*est en raison de*) the depth of the cul-de-sac, since the portion which forms the cul-de-sac is precisely that which has been detached from the abdominal wall. From reading M. Sappey it would seem that the more the bladder is distended the less room there is to

penetrate into its cavity, since the more the peritoneum comes down. Now this is not correct; I repeat, the portion of peritoneum which invests the anterior wall of the distended bladder is no other than that which lined the anterior wall of the abdomen before the distention, as may be thus proved: measure the distance between the pubes and the peritoneal cul-de-sac, and that between the cul-de-sac and the apex of the bladder—that is to say, the insertion of the urachus—the distance is the same, and cannot be otherwise. Then the space uncovered by peritoneum is so much the larger as the cul-de-sac is deeper—that is, as the bladder is more distended. The peritoneum plays no active part in the distention of the bladder—does not descend—its rôle is purely passive; the bladder crowds upward, and is but partly covered.”

Cruveilhier and Richet only briefly refer to the fact of the accessibility of the bladder above the pubes.

Bourguery and Jacob, in their splendid work, *Traité Complet de l'Anatomie de l'Homme*, tome v., Pl. 55, Figs. 10 and 12, represent the peritoneum as covering all except a very small portion of the anterior surface of the bladder.

The subject is entered upon more at length by Jarjavay, who (*Traité d'Anat. Chir.*, tome ii. p. 588) speaks of the loose cellular tissue which permits of distention as the bladder is full; but says that when from chronic inflammation lymph has been effused in its meshes, it is no longer distensible.

“M. Petrequin, who has established this point by clinical as well as post-mortem observations, advises for this reason that the hypogastric puncture should be made immediately above the pubes. This practice differs from that prescribed by most authors, according to whom the place of election is at a distance of four centimetres (Malgaigne), of twenty-seven millimetres (Velpeau and Coster) above this bone. The danger of wounding the peritoneum justifies the counsel of the Lyons surgeon, in cases in which adhesions have engaged the bladder and prevented its upward development; but when the viscus is free, there exists between it and the symphysis a cellular interval where the trocar might go astray and pass into the pelvis without encountering the vesical wall. Thus, in the majority of cases, puncture at twenty-seven millimetres above the pelvic brim is preferable.

“We have several times had occasion to remark that the anterior

face of the bladder is without peritoneal covering; and on this anatomical arrangement are based hypogastric puncture and lithotomy. Yet it has happened that the serous membrane has been wounded as the bistoury was carried upward toward the upper part of the bladder.

"The gravity of this accident has certainly been overestimated. What renders it formidable is much more the effusion of urine into the serous cavity than the entrance of air. Now, upon contraction of the bladder, the two wounds—that in the anterior wall of the bladder and that in the peritoneum—no longer correspond, and, hence, effusion of urine into the serous cavity is less easily produced. According to Velpeau, Douglas, Thornhill, Frère Côme, Souberbielle, Crozat, and Leonardon, each had the misfortune to wound the peritoneum, yet their patients made perfect recoveries. The employment of the sonde à dard, and the making the incision from above downward, may, to a certain extent, guard against this accident."

This author in another work (*Récherches Anat. sur l'urètre de l'Homme*) gives three plates of sections of frozen bodies, and in them the peritoneum is represented as actually in contact with the symphysis pubis. The bladder is in each case contracted; in plates vi. and vii. very much so, and its walls very thick.

In the *Philadelphia Medical Times* of May 31, 1884, a report is quoted from the *London Medical Record*, of a discussion on the anatomy of the hypogastric region, the subject having come up apropos of a suprapubic lithotomy performed by Després. This gentleman regarded the pyramidalis muscles as important landmarks, whereas MM. Sée and Bouley thought they varied in size and situation.

"As to the relations of the prevesical cul-de-sac of the peritoneum to the upper border of the symphysis pubis, a careful dissection of thirteen bodies had led M. Bouley to the following conclusions: When the apex of the bladder is situated nine to thirteen centimetres higher than the symphysis, the height of the peritoneal fold above the same point can be found by deducting four centimetres from those numbers. When the bladder reaches five to nine centimetres above the symphysis pubis, three centimetres must be deducted. It is, however, essential to remember that the peritoneal fold stands relatively

higher in fat than in thin people. M. Bouley has also repeated the experiments of Petersen, who had the idea of raising the peritoneal *cul-de-sac* above the symphysis by means of an India-rubber ball introduced into the rectum and distended by water; this process seems to answer well, especially in fat people. It is necessary to inject 400 to 600 grammes (about one pint) of water."

This estimate is for many cases too high.

Holden (*Landmarks, Medical and Surgical*, p. 31) says that

"With a bladder distended half way up to the umbilicus, there is a space of nearly two inches above the symphysis where the bladder may be tapped without risk of injury to the peritoneum."

So far, the evidence of anatomy has been favorable. But the conditions are not always the same. They are, of course, well known to vary with age. Thus in children the bladder rises above the pubis, and is an abdominal rather than a pelvic organ; while with later development the bony framework grows much more massive, and the bladder drops down behind it, so as to occupy the anterior part of the pelvis, and only to appear above the pubis when considerably distended.

In a leading article in the *Lancet* for January 30, 1886, it is stated that

"M. Polaillon recently showed at the Soc. de Chir. the urinary organs of a calculous patient, upon whom he had unsuccessfully attempted suprapubic lithotomy. The bladder was distended by an injection of 150 grammes of fluid, and the rectum was distended in the usual manner—yet the peritoneum was found to extend over the bladder quite down to the pubes. He verified this by making an incision into the serous sac, through which he introduced his finger and exactly traced the reflection of the peritoneum. The wound was sewed up. The wound healed, and several months later the patient died of pyelonephritis. At the necropsy the bladder was found to be hypertrophied and contracted, fitting closely around a stone measuring in circumference four centimetres by two. The peritoneum passed quite down to the pubes. Ureters dilated."

It would obviously be a very awkward thing to attempt the tapping of a bladder so covered. I cannot but think, however, that the condition of things here mentioned was the result of some pathological change. Certainly it was altogether exceptional; but the possibility of its occurrence should be borne in mind.

Let us now look at the records of experience in the performance of suprapubic operations. It is very possible, I must admit, that many cases of this kind may have occurred which have not been published; and if so, it is highly probable that among these unreported instances a large number were failures. For unfortunately, surgeons are too apt to let the world know of their triumphs, while they say nothing about their ill-successes. Yet it has seemed to me fair to present what records there are, and to draw from them such inferences as they seem to warrant. The length of time over which these experiences have extended was to me a matter of considerable surprise.

1725. Daniel Turner, in his chapter on "Wounds of the Bladder," speaks with high praise of the suprapubic section for stone, as performed by friends of his at St. Bartholomew's Hospital. He says:

"I have been witness of the large solutions of continuity this part of the bladder undergoes; yet, by help of a medium furnished by its sides, after digestion, together with that from the superincumbent parts, the same in little time consolidates, and is perfectly agglutinated."

He then cites three cases of accidental wounds of the bladder, successfully treated; and quotes in full the well-known and curious account of the operation done by Probyn, in 1694, for the removal of an ivory bodkin from the bladder of a girl. In this case the incision is stated to have been made at the outer side of the rectus muscle.

Dionis, who was certainly one of the best informed and most intelligent writers of the last century, goes very fully into the subject of the treatment of retention of urine, and describes the

perineal operation; but does not even hint at the possibility of affording relief by puncture or section above the pubis. Yet he gives a most excellent account of the high operation for stone.

1761. Sharp had evidently been practically familiar with the suprapubic operation for the relief of retention of urine, which he says had "been occasionally followed by some eminent surgeons for many years, and was still approved of;" but the only instance he mentions is one in which a trocar of too great length had wounded the rectum.

1768. Heister cites the experience of Turbier, Mery, Douglas, Middleton, and Werlhoff, but gives special mention to only one case, a successful one, in the practice of the last-named surgeon. He distinctly asserts that they had all obtained favorable results from the procedure.

1775. James Lucas made a suprapubic puncture in the case of a man aged thirty, who seventeen days previously had received an injury to the perineum, followed by abscess. Recovery took place, but a year later the man had still a perineal fistula.

1776. Frère Côme operated with great success upon a gentleman who had, for twelve years, suffered severely from the effects of traumatic stricture; the patient himself wrote the account of his case fourteen months after the cure was accomplished.

1788. Sir E. Home gives details of a case in which he assisted John Hunter in performing suprapubic puncture in a man aged thirty, strictured for nine years. Cellulitis ensued, and there was a suspicion of peritonitis. On the removal of the tube from the bladder, at the end of forty days, it brought with it a slough, which was followed by nearly a pint of pus. Several abscesses formed, and sloughs came away, but in thirteen weeks the man was well, and continued so fifteen years afterward.

1789. Francis Turner treated a boy aged three, for retention of urine from obscure cause. Puncture above the pubes was resorted to on the third day, and again on the fifth, when the canula was left in place. On the eleventh day urine passed by the urethra, and on the thirteenth the canula was withdrawn. An abscess afterward formed in the scrotum. Two and a half

months later, the general health began to fail, and death ensued in about four weeks. An obscure account is given of a tumor found at the autopsy.

1790. Cheston recorded a case of retroversion of the pregnant uterus obstructing urination, in which relief was obtained by a suprapubic opening. He refers, in a note, to another case in which the uterus was punctured by too long a trocar, with fatal result.

1793. Noël reports three cases, of men aged sixty, sixty-six, and sixty-seven, respectively; in the first there was on the eighth day "suppurative gangrene" of the perineum and scrotum. On the removal of the canula the wound healed.

The third case is remarkable, in that the surgeon states that the canula was changed every tenth or twelfth day. He had in other cases feared to do this, because he believed

"That the bladder, in emptying itself, would leave the inner wall of the hypogastric region to go down again into the pelvis, and that in consequence of this displacement the opening made in the bladder would no longer correspond with the outer wound, which would not only render the reintroduction of the catheter almost impossible, but would moreover subject the patient to the danger of infiltration of urine."

1804. Pascal Baseilhac (nephew of Frère Côme), in a work published in defence of his uncle's views, asserts that suprapubic puncture of the bladder had been very frequently resorted to, not only by Frère Côme, but by himself, by Souberbielle, and by their pupil, M. Pot; and gives several cases, in one of which the patient was eighty-two years of age.

1813. Dorsey records a very favorable case.

1814. Vise, another very favorable case.

1819. Carpue, after a very brief description of the suprapubic puncture, says:

"My first objection to this operation is, that the urine is not evacuated from the bottom of the bladder. I remember, in a case where a common trocar was used, I dissected the parts; the bladder fell on the sharp edge of the trocar; this produced inflammation of the bladder

and peritoneum, which occasioned the death of the patient. In another case, a gentleman plunged a trocar through the linea alba; not any water followed. He passed a probe through the canula; he declared there was no urine in the bladder. The symptoms continued. The attendant surgeon was of the opinion that there was water. The patient died. The gentlemen examined the body; the bladder had burst. In truth, the trocar had pushed the bladder from its connection with the posterior part of the pubes, where it is slightly attached."

It seems to me that the unfairness of thus condemning an operation because of gross blunders in its performance, needs scarcely to be insisted upon; it is strikingly incongruous with the excellence of Mr. Carpue's book as a whole, and the more remarkable since he was a strong advocate of the high operation for stone.

1824. Gibson performed the high operation for stone, he thought, for the first time in this country. The patient lost his life, it would seem, through his own imprudence, a few days later.

1827. Lawrence is reported by Fereday to have twice tapped the bladder in the same man, for retention. The account given is not full or satisfactory.

1828. Parrish opened the bladder above the pubes after the failure of two attempts at rectal puncture, in the case of a man aged thirty-five, with injury of the perineum and scrotum. The relief given was immediate and complete; but a few days later the scrotum sloughed, bedsores formed, and death finally took place from hectic.

He relates also the case of an old gentleman, treated by his preceptor Dr. Wistar, for enlarged prostate, in whom a gold tube was introduced through a suprapubic opening, and worn for two years. The patient was completely relieved, so as even to ride on horseback. Thinking himself cured, he removed the tube; the symptoms recurred and he died.

1837. S. Oliver operated with success on a woman aged thirty-five. The account given is obscure.

Betton reported a case of rupture of the urethra by traumatism, in which suprapubic tapping of the bladder gave great

relief, but on the seventh day the patient died, it is stated, "from mere exhaustion and debility." At the autopsy "the membranous portion of the urethra was found lacerated for about the space of two and a half inches; a great deal of blood effused in the cellular tissue of the perineum." Free incisions in the latter region would probably have saved the man's life.

1839. Velpeau mentions a case in which he practised suprapubic puncture twice in three days. The patient died of peritonitis on the sixth day, and a small blackish spot was found in the hypogastrium in front of the bladder.

Yet he quotes a case in which the operation was twice done in the same patient; in 1828 by M. Vaust, and in 1834 by M. Voltem. The man wore a rubber tube, and had no trouble.

He quotes also from M. Nick the case of a man aged seventy-two, on whom hypogastric puncture was performed for an ischuria. The patient wore a canula until he died, a period of twelve years.

1841. Toogood published an account of a case of enlarged prostate, with retention of urine for four days; suprapubic puncture gave relief; the wound was carefully closed at once, and healed. About a year later, the irritation of a calculus in the bladder gave rise to fatal peritonitis.

1842. Macilwain operated on a man aged sixty-seven, for retention due to enlarged prostate. The patient was the subject of double inguinal hernia. There was no difficulty in the operation, which gave relief; but the patient died of exhaustion in forty-eight hours.

1844. Heylaerts reported a favorable case.

Chassaignac performed suprapubic section in a man aged sixty-four, who had had several previous attacks of retention from stricture. Urination was thereafter performed by the hypogastric opening.

In connection with this case Chassaignac proposed extruduction of a catheter, or as he calls it *retro-urethral catheterization*. The idea was strongly advocated, he says, by Rognetta, in the *Annales de Thérapeutique et de Toxicologie* for October, 1844. It has been promulgated by Brainard and others, but has never, I

think, been fully appreciated by surgeons, or duly noticed by authors.

1848. Syme reported a very favorable case in which this procedure was resorted to, on the fourth day, after rupture of the urethra, in a youth.

Brown recorded a case operated on by Mr. Luke; a man, aged fifty-four, strictured thirty-four years. A canula was inserted, and retained for one hundred and sixty-two days, when a cure had been effected by catheterization.

1849. Brainard published a case which deserves special mention. The man had suffered from gonorrhœa and gleet for eleven years. On the 8th of December, 1848, he was tapped, and a long canula left in. On the 9th of February following, a bougie was passed through the bladder forward into the urethra, and the stricture thus dilated. The canula was withdrawn March 4th.

I believe this was the first recorded instance in this country, of this excellent mode of practice. Chassaignac's case has been already noted.¹

1850. Gisborne gives a case of distention and partial paralysis of the bladder from enlarged prostate, in a man aged sixty. Suprapubic puncture was resorted to with success.

Wakley operated in a case of retention from injury in a child aged twenty months. The canula was kept in for three days, when catheterization was found to be easy, and in eight days the child was discharged cured.

1851. Manson operated on a mulatto man aged thirty, crushed under timber. The bladder was paralyzed; for some unexplained

¹ In a leading article in the *Med. Times and Gazette* of July 15, 1876, mention is made of the fact that Volkmann had performed "posterior catheterization" in a boy aged six and three-quarters years, for the relief of rupture of the urethra; and it is claimed that the procedure had been adopted by Hunter, and by Verguin in another case of rupture of the urethra. In a later number, September 30th, Ranke claims to be "the experimenter in regard to this operation;" but he also says that Verguin's case was reported thirty years before the publication of Hunter's work on Syphilis. Neither Chassaignac's nor Brainard's case seems to have been known to the writer of the article, or to Volkmann and Ranke.

reason a catheter could not be passed. A tube was kept in about one month.

Monod reported a case in which, suprapubic puncture for retention being performed, the middle lobe of the prostate was wounded by the trocar.

1852. Maund employed this procedure in a case which proved fatal from rupture of the kidney.

1854. Waddell reported the case of a man aged seventy, with old stricture. Rectal puncture was tried unsuccessfully, and then a suprapubic opening was made, and a silver tube inserted *en permanence*.

Williams, in the case of a man aged thirty-two, with stricture and a ruptured urethra, made a suprapubic section with a view to the extruduction of a catheter. Failing in this attempt, forced catheterization was resorted to. A slough came away, and the suprapubic wound closed by the twenty-seventh day.

1856. Cazenave reported a similar case.

Van Buren was called upon to treat a man aged thirty-five, of very bad habits. He had been strictured for six or eight years, and had been twice subjected to perineal section, and twice to suprapubic puncture; he had also a large hernia. The opening above the pubes was renewed with a trocar. Death ensued from peritonitis, ascribed partly to extravasation of urine.

Lacroix gives the history of two successful cases in his practice in 1853, and refers to others.

Fox reported the case of a boy aged thirteen, with injury to the perineum. Suprapubic puncture (section?) was done on the fifth day, and seven days later, the extruduction of a bougie. Nine days after this, an abscess burst between the bladder and the rectum; a perineal opening ensued from sloughing, but the boy recovered with only a large cicatrix.

1858. Nélaton spoke of suprapubic puncture as the method most frequently adopted in retention of urine; recommending a trocar and canula, the latter to be retained in place by tapes.

1859. Norman reported the case of an elderly man with enlarged prostate, in whom, after suprapubic puncture, the wound cicatrized around the catheter, which was withdrawn. The man

used a bit of bougie as a plug, and occasionally drew off his water with a female catheter. He lived several years.

Mr. Thomas Paget, after mentioning four cases, says of suprapubic section for retention: "This operation I have seen and practised for fully forty-five years."

1859-60. Mr. Sloan reports a case of fracture of the pelvis and rupture of the urethra, in which suprapubic tapping was done, but death from peritonitis occurred on the fourth day.

1861. Norton records a successful case in a child.

1862. Chassaniol reports a case in which he resorted to suprapubic tapping twice, at an interval of seven years. Two months after the second operation the man died, "of gradual absorption of urine." Is it not likely that there was disease of the kidneys, and failure of their function?

1863. Gason published an account of a man aged sixty-eight, who had for twelve hours been subjected to attempts at catheterization; false passages had been made, and much damage done. He died about thirty-six hours after suprapubic tapping, probably of secondary shock. There was sloughing, and perhaps pyæmic peritonitis.

1866. Callender gave the history of a man aged twenty-six, with retention from stricture. He had had gonorrhœa for over seven years. Suprapubic puncture was performed March 18th, and an elastic catheter kept in the wound. All went well until April 20th, when diffuse suppurative inflammation of the scrotum began, and was treated by free incisions. A silver canula was now substituted for the elastic one, and was left in for three weeks. It became encrusted, and the opening had to be enlarged. Sinuses had formed. October 27th, extraduction of a catheter was practised, a straight instrument was passed by the meatus, and the two were joined by dissection. After this the case was treated like an ordinary perineal section. Some calculi were extracted through the suprapubic opening, which soon closed afterward.

According to Keyes, "Maisonneuve was in the habit of puncturing bladders in this manner, with an ordinary fine trocar, at the Hôtel Dieu, Paris."

1867. Mackie operated on a man aged forty, who had had for thirty hours retention from stricture. A gum catheter was left in the bladder for forty-eight hours. On the second day urine passed by the natural route.

1870. Hulke, in the case of a man aged forty-two, found the suprapubic puncture very difficult on account of the patient's obesity, which was thought to preclude perineal access to the bladder. The trocar and canula penetrated two and one-half inches of fat. The canula was removed on the ninth day.

Draper reported the case of a man aged sixty-five, with enlarged prostate, in whom puncture, with the retention of an elastic tube, gave entire relief: death, however, occurred from exhaustion a week later.

1871. Sexton reports the remarkable case of a sailor who, while at sea, and suffering from retention, relieved himself by puncturing his own bladder above the pubes with a knife.

Calhoun saw at Langenbeck's clinic at Berlin a case of retention from enlarged prostate, in a man aged sixty-eight, in which suprapubic puncture was resorted to with perfect success.

1872. Stevens performed suprapubic aspiration upon a young Bengalee, for retention; next day the catheter was used, and later the stricture was cured by Holt's method.

A notable case was recorded by Sewall in the same year. A man aged seventy-two had retention for thirty-six hours, from stricture. Suprapubic section was performed, and a gum-catheter inserted; at the end of four days this was replaced by a silver tube, which was worn for ten weeks. The wound healed in three days after this tube was removed. Eight months later the patient caught cold, and suffered from retention again; another puncture was made, and the tube worn three or four weeks, when the cure was complete.

1873. Whittaker reported the case of a lad of eighteen, with rupture of the urethra; suprapubic aspiration was done, and recovery ensued.

Loomis reported the case of a man aged seventy-one, with retention from enlarged prostate, for which suprapubic aspiration was done five times; death taking place from pneumonia,

the parts were examined, and it was found that some of the punctures had wounded the peritoneum, but there had been no peritonitis.

Mr. Joseph Bell reported a case which had occurred under his care, in which a man of sixty-five, who had been cut for stricture in 1860, suffered from retention, and was relieved by aspiration above the pubes. This was thought to be the first operation of the kind in Scotland.

1874. Taylor reported a case of retention from enlarged prostate in a man aged seventy-four. Suprapubic aspiration was done seven times. After death, fifteen days later, no trace of the punctures could be perceived.

Rose reports the case of a man, aged sixty, with retention from enlarged prostate; a canula was inserted above the pubes, and remained ten days; the wound healed in two weeks.

Whitehead gives an account of a man, aged fifty-eight, with enlarged prostate and subacute cystitis; retention coming on, was relieved by suprapubic cystotomy, the edges of the wound in the bladder being stitched to those of the wound in the skin. Death ensued from diarrhœa on the fourteenth day. Septicæmia was suspected.

Angelot reported a case which had occurred in M. Demarquay's service; a man, aged sixty-five, after being punctured seven times above the pubes for retention, died on the eleventh day. No trace of the punctures was discernible after death.

Hall, in the case of a man aged seventy-eight, performed suprapubic aspiration nineteen times in seventeen days.

A case is reported by Speir, in which the operation was repeated fifteen times; one by Guthrie, in which it was done eighteen times; and one by Brown, in which it was done fifteen times.

1875. La Garde reported a successful case of aspiration done with a hypodermic needle, a rubber tube, and a bottle with a canula passed through the cork.

Mixon reported the case of a man, aged sixty-eight, with retention for twenty hours, in whom the bladder was opened above

the pubes with a bistoury, and a female catheter inserted. Recovery was rapid and complete.

Taylor treated a case of retention from enormous hypertrophy of the prostate, in a man, aged eighty, by suprapubic aspiration. It was thrice repeated, with relief, but the patient died.

1876. Dora recorded the case of a clergyman aged sixty-four, with prostatitis, greatly relieved by suprapubic puncture, although death ensued from exhaustion about ten days later.

Porcher reported a case in which the operation was done thirteen times for retention.

Mention is made in the same year of a case in which Dr. Malherbe, of Paris, had the misfortune to break the aspirator tube in the bladder; the fragment was unextracted, and caused death. (It certainly seems strange that in this case the idea of direct section did not suggest itself.)

Volkman reported the case of a boy, aged six and three-quarters, with rupture of the urethra, in whom he performed suprapubic section, with posterior catheterization. He thought that a similar operation had been done by Hunter, as well as by Verguin. Ranke, however, states that Hunter only made the suggestion, and that Verguin had reported his case thirty years before Hunter's work (*On Syphilis*) was published.

1877. Peixoto reports a case of old stricture of the urethra, with false passages; complete retention of urine, relieved by suprapubic puncture; vesical hemorrhage from over-distention; urethrotomy; cure.

Shepherd reports the case of a man aged sixty-two, in whom retention (probably from enlarged prostate?) was relieved by suprapubic aspiration done at least once in twenty-four hours for thirteen days. He says he has repeatedly adopted this course with satisfaction.

J. W. Browne reported a case in which a man aged forty-three, affected with stricture, was subjected to suprapubic puncture; the canula was removed after two days, and later, a puncture by the rectum was performed.

1878. Gay published the case of a man aged twenty-eight, for thirteen years the subject of stricture, who had retention,

and on whom suprapubic aspiration was done nine times in four days.

Howse reported the case of a young man aged twenty-two, whose urethra had been ruptured, with fracture of the pelvis. Seventeen months after, perineal section was done, and seven months later, suprapubic section, with extrusion of an instrument, and division of the stricture. A good result was secured. In the discussion on this case, Mr. Teevan is reported to have said that "numerous deaths had been recorded after suprapubic sections."

Wick gives the history of a man aged fifty-eight, with retention from enlarged prostate; catheterization was found impossible; suprapubic puncture was performed six times, each time at a different point; recovery ensued.

Vanderveer recorded the case of a man aged sixty-two, with retention from enlarged prostate; suprapubic aspiration was resorted to twelve times, then a canula was inserted, and by means of it a rubber tube. The result was excellent.

1879. Styll gives an account of a case of stricture with retention, in a man aged thirty-seven; aspiration above the pubes was done every twelve hours for three days, with good result.

Mr. Hulke also records a case of old stricture in a man aged forty, in which, after aspiration, the bladder was tapped above the pubes, a canula fastened in and retained four weeks. An instrument was then passed from behind forward, another from before backward, and the intervening tissue divided.

1880. Treves published a case in which retention was relieved by suprapubic puncture. The patient went out on the third day, but returned within a week, very ill. About three weeks later he died, and at the autopsy no trace of the wound in the bladder was found; there was suppurative pelvic cellulitis.

Campbell reported a case in which, after suprapubic aspiration on two successive days, on the third internal urethrotomy was resorted to. In a day or two there was inflammation at one of the punctures, followed by abscess, peritonitis, and death.

1881. Mr. Thomas Smith gives nine cases of suprapubic puncture, and says that he has, on other occasions, employed

the same means of relief for prostatic retention. He speaks of three cases of children, in which retention caused by the pressure of tumors had been thus remedied. In one case of stricture, in a man aged fifty-seven, puncture was resorted to, and on the second day pneumonia set in, which proved fatal. Mr. Smith had no idea that there was any connection between the operation and the issue of the case.

Stein quotes a case of Liston's, in which a man had a cyst which caused dysuria by falling into the urethra. The cyst was removed through a suprapubic opening; the wound was closed, and the man recovered, living for some time.

Also from Billroth, the case of a boy aged twelve, in whom perineal cystotomy was done for a tumor. A suprapubic incision was then made, both recti muscles were cut across, and a transverse incision was made in the bladder wall. The tumor was removed; through drainage was kept up until the fifth day, and in thirty-four days the wound had closed.

Also from Volkmann, the case of a man aged fifty-four; the operation was the same as in Billroth's case, except that the upper wound was "made on the finger passed through the perineal wound." A tumor having been removed, the upper wound was closed by sutures, and a drainage tube was placed in the lower. Peritonitis ensued, and death on the third day.

Also from Marcacci, the case of a man, aged fifty-four. An incision thirteen centimetres in length was made, an enormous tumor removed, and the wound in the bladder closed with four catgut sutures, that in the abdominal wall with metallic sutures; antiseptic dressings were applied. On the tenth day the metallic sutures were removed, and a few drops of urine escaped from the openings where they had been. Urinary fistulæ remained, and the "patient died within two months after the operation, from extravasation of urine, pelvic abscess, and peritonitis."

Gross mentions the case of a farmer, in whom the wound made, through which a tube was worn for several months, reopened after fourteen years, the integuments having been the seat of erysipelatous inflammation. Urine flowed through

the opening for about four weeks, or until the patient died from constitutional exhaustion.

1883. Anger reported a case in which suprapubic section was performed for the relief of cystitis; on the third day an abscess of the kidney burst into the peritoneum, with fatal effect.

Hyatt recorded the case of a man, aged sixty, whose bladder he opened above the pubes for the extraction of a piece of metallic catheter. The peritoneum was opened, the orifice being three-quarters of an inch in extent; its edges were brought together and stitched to the abdominal wall. Recovery was complete in four weeks.

1886. Treves published the case of a man aged fifty-five, admitted to the London Hospital in August, 1885, with complete retention for thirty hours. He had had traumatic stricture for nineteen years, and for seven years his urine had dribbled away, the bladder having been during all that time so distended as to be visible above the pubes. Suprapubic puncture with a trocar was done, and a few days later a soft rubber tube was inserted in place of the canula. In May, 1886, he reported that he had worn the tube ever since, with a cork.

Southam gave an account of a case of papillomata of the bladder in a man, aged forty-one. Exploration was first made by means of a perineal opening; free access was then obtained by a suprapubic section, the tumors removed, and bleeding checked by means of hot water and tincture of iron. A good cure resulted.

Pitts reported to the Clinical Society of London a case of tumor, in a man, aged forty-five, removed by suprapubic section, with a good recovery. Sir Henry Thompson, on the same occasion, spoke of three similar cases.

Wile reports a case in which suprapubic aspiration was done twice a day for four days, with good result.

Harrison quotes a case from the practice of Mr. Mitchell Banks, in which suprapubic tapping was done at sea four days after a rupture of the urethra. Six days later, the man arriving at Liverpool, Mr. Banks made a perineal opening and through drainage. The patient made a good recovery.

Dr. W. H. Bennett recently reported to the Royal Medical and Chirurgical Society the case of a man aged thirty-eight, who had had retention of urine for three days. Aspiration was performed above the pubes, and extra-peritoneal rupture of the bladder immediately occurred. The abdomen was laid open, and the bladder thereafter drained by a perineal incision. For forty-eight days the patient did well; then an opening formed between the bowel and the prevesical cavity, and he sank.

In connection with the previous case, Mr. Bryant cited that of a man aged thirty, in whom suprapubic aspiration was done for retention, and later a perineal section. After death, suppurative peritonitis, with a sloughing abscess from extravasation of urine, was found.

He also mentioned the case of a man aged seventy-eight, with retention from enlarged prostate; suprapubic puncture was performed seven or eight times, and after death it was found that each of the six openings "would allow of the escape of urine into the peritoneum." (I must confess that this statement puzzles me, if the operations were properly performed).

Prof. Humphry referred to a case of enlarged prostate with retention, in which suprapubic puncture was followed by fatal extravasation of urine.

Mr. Baker has published an account of a man aged fifty-five, affected with sarcoma of the bladder, for which a perineal operation was done October 11, 1884, and part of the growth removed. It however grew rapidly, and on January 1, 1885, suprapubic puncture was made, and a red elastic catheter introduced, with a tube converting it into a siphon, so as continually to draw off the water. January 16th, this began to be painful (by increase of the tumor?) and it was removed, a pad of absorbent wool being substituted for it. Death took place January 19th.

Mr. W. Thomas reports a curious case of obstructed micturition in a boy aged four, from congenital malformation at the meatus urethræ. Suprapubic section was done, and on the introduction of the catheter a valve-like septum was discovered and divided, after which a cure was readily effected.

He gives also a case of ruptured urethra in a boy aged eleven,

treated by perineal incision and suprapubic aspiration, with success.

Sheild gives his experience as decidedly in favor of the suprapubic puncture in cases of retention, and quotes the expression of one patient, that it was the easiest way in which he had ever had his water drawn.

1885. Thistle gives six cases, five of retention from stricture, and one of retention from enlarged prostate, in which the bladder was entered above the pubes. Three were aspirated, and three tapped, one of the latter being the patient with enlarged prostate, who was seventy-three years old.

In all the procedure was successful.

1887. Fairbanks reports a case in which a man aged seventy-six, after slight trouble for some weeks, had retention, which was for three days relieved by the use of the catheter; then this became impossible, and suprapubic aspiration was relied upon for fifteen days, during which all the urine was drawn off in this way, except once, when the catheter was used. Aspiration was performed thirty-two times. After this the catheter could be again passed, and by degrees the bladder resumed its function.

I propose now to give the results of my own experience in this direction; some of the cases, as will be noted, were extremely unfavorable, and yet the patients did well. Several of them, it seems to me, could not have been successfully dealt with in any other way than by suprapubic section.

I have already referred to the case which I saw with Dr. Donnel Hughes, in November, 1883, in which we opened the bladder above the pubes for the purpose of removing a foreign body, the patient making an uninterrupted recovery.

For several years it has been my practice, in cases of retention from stricture such as we ordinarily meet with, after the failure of a fair attempt at relief by catheterization, to draw off the urine by aspiration. Very generally an instrument has passed readily within the twenty-four hours succeeding the operation. I do not now remember having had occasion to do

this more than once in any one case, but my records in this respect are unfortunately quite imperfect.

One patient, with greatly enlarged prostate, was much relieved by the aspiration, and next day I succeeded in passing a catheter. His family, however, called in another surgeon without notice to me, and in a day or two I heard of the patient's death—from what cause I do not know. This is the only instance within my personal knowledge in which there was any ill consequence following aspiration, and here I see no evidence connecting the operation with the fatal event.

On the 7th of July, 1885, I was called by Dr. R. B. Okie, of Berwyn, to see Mr. G., aged sixty-five, at Howellville, Chester Co., on account of retention of urine from enlarged prostate.

Mr. G. was a man seemingly in good health, but much distressed by frequent ineffectual calls to urinate, and by distention of his bladder. With a very long catheter I drew off his urine, but he wanted more permanent relief, as there was no medical aid within several miles of his residence.

I therefore, with the aid of Drs. Okie, Rickabaugh, and Roberts, on the same day etherized Mr. G., and performed the suprapubic section, putting in a glass ovariectomy tube, curved for the occasion. Dr. Okie made an ingenious arrangement with a piece of the thin gum-cloth known to dentists as "rubber dam," by means of which the urine as it flowed from the tube was prevented from coming in contact with the skin.

Two or three nights afterward the patient had a curious attack of almost maniacal excitement, which however soon passed off, and he became quite himself again. He began to sit up, and to be about his room; and was beginning to learn to pass the catheter for himself, when, on July 19th, making some slight effort, he fell dead.

A post-mortem showed the heart to be fatty, with vegetations on the mitral valve. There was an immense lobulated prostate, but the wound in the bladder was quite healthy and free from irritation.

Jacob O. C., aged forty-three, was admitted into the Pennsylvania Hospital, January 21, 1885, on account of retention of urine. He had been a hard drinker; had gonorrhœa at seventeen, for the first and only time; became strictured at twenty-two, and in 1873 was "cut" for this. About a year after this operation he could pass

a No. 7 instrument, but has had occasional attacks of retention ever since.

On admission, he confessed that he had been drinking hard, and he was very much broken down. His bladder was greatly distended and very tender; no instrument could be passed; urine was forced out in a very small twisted stream, with great effort. He had frequent chills, alternating with profuse sweating.

A large poultice was applied to the abdomen; opium and belladonna were given by suppository; and he was put upon nourishing diet, with a certain allowance of stimulus.

On the next day, January 22d, Dr. Morton made a perineal incision and passed an instrument, which was felt in the hypogastrium. Pus flowed very freely. By a happy chance the catheter entered the bladder, and a very large quantity of urine was drawn off, to his great relief.

On the 23d the bladder was again distended, and the orifice could not be hit with the catheter. I recommended suprapubic section, to which Dr. Morton agreed, and asked me to operate, as he had a sore hand. I made a free incision in the median line, and laid open first an abscess cavity, then that of the bladder. A catheter was now easily passed from the suprapubic wound through the bladder into the urethra and out at the perineal opening. A drainage tube was substituted for the catheter, and left in place. Poultices were applied, and he was put upon opium and tonics, with liquid diet and stimulants. His condition steadily improved. Free drainage took place from the bladder, and in a few days carbolized oil was substituted for the poultices.

February 4. He has been feeling weaker for several days, his appetite has left him, and he is chilly.

On the 6th he was quite ill, with thirst, vomiting, a dry tongue and anxious face, sordes in the mouth, and high temperature. Ordered champagne.

On the 7th a mass of slough came away from the suprapubic opening. From this time he had no serious drawback.

The drainage tube was kept in until March 6th, when it was removed, and a catheter passed through the whole urethra and secured.

The wounds gradually healed, and on the 21st of April he was discharged cured.

Harry F., aged forty-three, was admitted into the Pennsylvania Hospital, April 28, 1886, with retention of urine, which, however, dribbled from him. He said that on the 24th he strained himself in trying to urinate, and had passed no water since. His condition on entrance was very critical; the penis and scrotum were enormously swollen, the prepuce œdematous; the skin of the lower third of the abdomen was swollen, tense, and dusky red; the skin round the under surface of the root of the penis was purple, and on the eve of sloughing; the swelling had invaded the perineum.

I at once had ether administered, and made free incisions into the swollen tissues, giving exit to semi-purulent urine. I then exposed the distended bladder, and passed a trocar and canula into it; on withdrawing the trocar, an immense flow of urine took place. Enlarging the opening, I then substituted for the canula a rubber tube, putting a silk stitch through the side of this and the wall of the bladder. One silver wire suture was applied at the upper part of the wound, which was dressed with iodoform and carbolized gauze.

Next day, the symptoms being greatly relieved, I performed a perineal section, in doing so passing through an abscess cavity which seemed to surround the neck of the bladder.

The man did very well; on the 2d of May some sloughs came away from the suprapubic opening, and a silver tube was substituted for the rubber one. Exactly how long this rubber tube was kept in, I can find no memorandum, but it was several weeks.

On the 4th of June a small bougie was easily passed through the urethra into the bladder, and thereafter instruments of a larger and larger size were used until July 13th, when he was discharged, the canal readily admitting No. 11 of the English scale, and his urine flowing freely. I have seen him repeatedly since, in perfect health, and attending to an active outdoor business.

Mr. S., aged sixty-three, had suffered from enlarged prostate for several years, with frequent attacks of severe hemorrhage. He was a very large and stout man, well nourished. I was called to see him in the country, August 13, 1886. His bladder was very largely distended, and he was in great suffering. An instrument could be passed only with extreme difficulty, and brought away no water, but clots of blood. The prostate was enormous.

He was etherized, and I performed suprapubic section, opening the bladder freely. The subcutaneous fat was very thick, and, of course,

the bladder lay very deep ; yet there was no difficulty. A very large nodulated prostatic growth could be felt with the finger. Great relief was given by the operation. A tube was inserted, first of soft rubber, and then a glass one, as more easily kept clean.

On the 17th he was able to transact some very important business affairs. The great difficulty was to keep him dry and clean, as the capacity of the bladder was so reduced as to cause the urine to overflow continually. He was also much troubled by flatulence, and by the annoyance of using a bedpan. His strength continued to fail, and he died worn out on the 29th, sixteen days after the operation.

William E., aged seventy, was admitted into my ward at the Pennsylvania Hospital, April 24, 1887, suffering intensely from retention of urine. He had for many years had increasing difficulty in urination, from enlarged prostate ; his feet and legs had occasionally been œdematous. On admission his bladder was distended as high as the umbilicus ; his clothing was saturated with blood, which was still flowing from the meatus, as the result of strenuous efforts at catheterization made the previous evening. His pulse was weak and thready, and his mind confused. My colleague, Dr. Morton, saw him at the time, and thought the case so urgent that the resident surgeon, by his direction, at once performed suprapubic cystotomy. The wall of the bladder was found very dark, as if gangrene was commencing. A small incision was made, and a very large quantity of putrescent urine flowed away. Some large clots were removed. An exploration with the finger revealed a very large and hard bilobed prostate. A rubber tube was passed into the bladder through the wound, and a No. 10 silver catheter was passed by the urethra and left until the second day. The urine contained about one-half albumen, a good deal of blood, and some granular casts.

Great relief followed the operation, but it was found impossible to keep him dry, partly because of his restlessness. He wandered a good deal in mind after the third day, and passed into a typhoid condition, which terminated fatally on May 8, the fourteenth day after the operation.

An autopsy showed much thickened bladder-walls, and the prostate enormously enlarged, as well as altered in structure, apparently by cancerous deposit. The kidneys were enlarged, cystic, and seemed to have been the seat of chronic parenchymatous inflammation. The pancreas was very large and hard. No sign of peritonitis appeared.

The heart was hypertrophied, with atheroma of the mitral and aortic valves.

Another case was admitted on the evening of the same day. Richard W., aged forty, had gonorrhœa ten years ago. Has now double inguinal hernia, and double hydrocele. A year ago he was admitted with retention, but was then readily relieved by the catheter. On admission, he had passed no urine for fourteen hours, and was suffering greatly.

He was fully etherized, and catheterization attempted without success. I, therefore, performed suprapubic section under antiseptic precautions. A rubber tube was introduced through the wound, and connected with a urinal. He is doing extremely well, and passes some water through the meatus; but as no instrument can be made to enter the bladder, I propose, in a day or two, to perform perineal section, and probably extraduction, so as to restore the urethra. [This course was carried out. The perineal section being made, an instrument was carried into the bladder, and kept there for several days; extraduction was, therefore, not necessary. Urination took place freely by the lower wound and through the urethra; and the suprapubic wound quickly closed. The man is, at the date of this note (June 1st), almost well, the stricture of the urethra still, however, requiring treatment.]

My colleague, Dr. Morton, permits me to refer to the case of an old gentleman, upon whom I assisted him in performing suprapubic cystotomy on February 19, 1886. The patient was the subject of enlarged prostate, and had to have a catheter passed at intervals of not more than an hour, always with intense pain, night and day. A glass tube was left in, and unstopped from time to time. Greater relief than he obtained could hardly be imagined. He has lived a comfortable life ever since, gaining flesh and strength, and going out as much as at his advanced age is desirable.

I have assisted Dr. Morton in at least two other cases in which the benefit was well marked, but the patients had had less suffering, and retained less vigor of constitution. Both of these died within a week or two, with sloughing from infiltration of urine.

Now in looking back over this array of cases, it seems to me that the absence of evidence of peritonitis, infiltration of urine, and urinary fistula is very striking. In not one is there mention of troublesome hemorrhage encountered during the operation.

Let me say that I have personally examined the records wherever they have been accessible to me, and that cases quoted as second-hand are so noted. I am aware that there are other published accounts, but they have been beyond my reach.

I can recall to mind a number of instances that have come under my notice in former years, in which, from the results of the practice of suprapubic section above noted, I believe that it would have been attended with success; and I should certainly have performed it, had it then been among my resources.

Had time and space permitted, I should have been glad to give the details of a number of these cases of prevesical abscess, of enlarged prostate, of foreign bodies or tumors in the bladder. But I cannot doubt that almost every surgeon will have met with like experiences, and will be reminded of them by this brief mention. My own intention is to add no more to the sad list of such failures.

We may now consider the details of the methods of procedure in opening the bladder above the pubes.

I do not hesitate to declare that the fullest antiseptic precautions should be observed in these cases. Surgeons have asked me "What is the use of all this, when the urine will be flowing through the wound?" But in the first place, the urine does not, in the majority of instances, flow through the wound. And in the second place, if it does, it is rendered less irritating and less hurtful by being rendered antiseptic. Moreover, experience has shown me that the early healing and the prevention of suppuration thus secured have been of direct and striking benefit in the subsequent progress of the cases.

I therefore have the parts shaved and cleansed as carefully and thoroughly as for an amputation or for the removal of a tumor; the instruments and everything which comes in contact with the wound and surrounding region must be rigidly clean

and antiseptic; when the bladder must be distended, boric acid solution is used for the purpose.

As to the necessity of distending the bladder, most of the cases in which I have myself been concerned have not required any such preliminary, the organ being already in danger of bursting from the pressure of the contained urine. And it seems to me that the mistake may readily be made of throwing too much into it. One of the reasons given by Cheselden for his abandonment of the high operation for stone, was that he had seen the bladder burst, and Carpue says that the patients complained bitterly of the distress caused by the bulk of liquid which it was thought needful to inject. In these days of anæsthesia, our patients know nothing about any such annoyance; but may there not be even more danger, especially where the walls of the bladder are weakened by long-standing disease, of taxing them too severely?

I do not believe the operation is facilitated by such energetic distention; the bladder need merely be distinctly felt, and for this purpose f5vj or f5viiij of boracic solution will be found amply sufficient. Especially is this true when the rectum is distended by f5xij to f5xiv of water thrown into the rubber bag.

With regard to the distention of the rectum, it seems to me there is less risk and more advantage. By thus preventing the recession of the bladder into the pelvis until all the arrangements for drainage are securely made, one possible source of embarrassment and danger is set aside.

In order to retain the fluid which has been injected into the bladder, Douglas, in 1719, had the penis compressed by flexion downward by the hand of an assistant. This seems to me preferable to the modern custom of tying a rubber tube or band around the root of the penis. In the female, should an operation of this kind be called for, the urethra can, of course, be readily compressed against the pubic bone.

By many writers (Chelius, Gross, Agnew, Sir H. Thompson, Keyes, and G. B. Browne) it is recommended that the bladder should be steadied by the hands of an assistant, when the incision or puncture is made. I cannot but think this not only needless,

but objectionable. The patient lies on an ordinary operating table, or in his bed, and the surgeon stands at his right, facing him. If the assistant stands on the other side, he is just as apt to pull the bladder out of place as to keep it steady.

The incision through the skin should be free enough to give ready access to the deeper parts. In fat persons, it must be about three inches; but when the abdominal wall is thin, two inches in length will suffice. When the cut is made exactly in the median line, no vessels of any importance can be encountered. The conjoined tendon being divided, the recti muscles present as a solid mass, and the interspace between them must be made with the knife or its handle. A layer of yellow fat comes next, and on cutting or scraping through this, the smooth dome-like shape of the bladder is seen at the bottom of the wound.

Before puncturing the bladder, it is very desirable to get control of it in some way, lest it should, as the urine flows away, collapse and settle back into the pelvis; the orifice made by the surgeon may then be very difficult to find, and it may be still more difficult to insert a canula. A small double hook, recurved and set at a right angle on a stem, has in my hands proved very convenient; it is applied to the wall of the viscus, exactly in the median line, and gives a very secure hold. A small tenaculum may answer much the same purpose, but its point may damage the operator's fingers. I have passed a double ligature, by means of a sharply curved needle, through the bladder wall, and held it by means of this.

When a large opening is to be made into the bladder, for purposes of exploration, the ligature is perhaps the best of these devices.

In cases of retention, the curved trocar and canula may now be at once pushed through the bladder wall, and the trocar withdrawn, leaving the canula in place, to be substituted later by a rubber tube.

The sonde à dard, an instrument of ancient date, like a staff, was formerly passed up through a perineal opening and made to thrust the anterior wall of the bladder; it has been revived

within a few years by Sir Henry Thompson, who, however, passes it into the bladder through the urethra. But if the exposure of the wall of the bladder has been effected as described above, this instrument is unnecessary. If the incisions have not been made, it is entirely possible for a fold of peritoneum to be engaged on the point of the sonde à dard, and thus to be cut through.

A curious proposition has been made by Duchatelet, and is quoted with approval by Villeneuve, that the opening should always be purposely made through the peritoneum, and thus, as he says, that "plasticity should be substituted for friability." Considering the fact that the danger of wounding the peritoneum has always been one of the strong objections to the suprapubic operation, it is only the boldest of the bold who would be likely thus to take the bull by the horns.

Having secured the control of the bladder, my own practice has always been to open it with a sharp-pointed bistoury close to the hook or ligature, making this orifice just about large enough to pass the tube which it is proposed to use. For purposes of exploration, it may easily be enlarged with a probe-pointed bistoury.

Von Antal has proposed to make an oval section of the muscular wall of the bladder, the long diameter of the oval parallel with the axis of the body; then holding the knife flatwise, he dissects off the included part of the muscular wall, exposing the bluish-gray translucent mucous membrane, which is to be divided vertically. Or he makes a vertical section first, and then introduces an elastic sac, which being dilated stretches out the edges of the orifice so as to admit of their being pared away. The sutures are carried through the outer and middle layers only of the bladder-wall, in order to avoid incrustation upon them; and the mucous membrane is supposed to act as a valve to prevent the escape of urine.

This procedure, which is certainly ingenious, is intended for sections made for the removal of calculi, when the bladder is to be at once sewed up. It might be applicable in other cases also, but could, I think, be simplified.

As to the proper point for entering the bladder, it seems to me that some of the older surgeons, in avoiding Scylla, steered into Charybdis. They were so afraid of injuring the peritoneum that they made the opening as low down as possible, and when the collapsed bladder sank, the orifice was carried down behind the pubis, so that the urine could hardly fail to find its way into the loose areolar tissue of that region, causing infiltration and all its attendant evils.

It seems to me that the proper point, as nearly as it can be indicated, would be about at the middle of the exposed portion of the wall of the bladder. This would be nearly in accord with Sharp's direction—an inch to an inch and a half above the symphysis pubis.

The next question is as to the arrangement for drainage. My own preference is usually for a soft rubber tube, of a length to be determined for each case. It should go well into the bladder even when this is collapsed, and should have lateral openings only near its inner or vesical end. It should be large enough to fill up the opening in the bladder wall without stretching it; and if it projects well out of the wound it can, if desired, be closed with a cork, or by means of a clip, or by bending its extremity double, and putting on a clamp of any kind.

I have twice used a glass tube with great satisfaction in cases of old men with atonied bladders. By means of a sheet of "rubber dam" slipped over the tube before its insertion, the patient can be kept perfectly dry, the urine being drawn off by a rubber tube into a urinal, or received in a mass of sublimated cotton, or in a large carbolized sponge. The glass tube is like that used in ovariectomy cases, but smaller, and curved in the arc of a large circle.

Metallic canulas may answer very well, in the absence of other tubes. Velpeau, writing at a period when rubber tubes were not to be had, declared the canule *à demeure* more dangerous in the suprapubic than in the rectal operation. He says of it: "Too long, it ulcerates the organ; too short, its tip, abandoned by the retracted bladder, becomes engaged in the surrounding tissues." In cases of enlarged prostate, it may

readily be imagined that any rigid tube, reaching the bas fond, might be a source of great irritation, its tip being continually rubbed against as the bladder expanded or contracted.

One or two writers have suggested the placing of the patient on his belly in order to favor drainage; but this would involve so much discomfort, and even risk, that I can hardly suppose the idea would be seriously entertained.

If a large opening has been made into the bladder, as for the purpose of exploration, the application of two or three catgut ligatures will suffice to close it around the tube. My own experience has been that here, as in cases of tracheotomy, the tendency of the wound is to heal quickly, except where the tissues, as well as the general system, are in a bad condition.

The edges of the wound in the skin can be apposed with sutures of catgut or silkworm gut, and, if necessary, a catgut suture can be passed through the wall of the rubber tube, and attached to the nearest suture, or to a strip of rubber plaster applied to the skin, and crossing the wound. Healing by first intention has taken place in several of my cases.

A few words only, in conclusion. My endeavor has been to examine fairly and without prejudice into the case for and against the suprapubic section of the bladder, apart from lithotomy; to trace the course of opinion with regard to it, and to ascertain how far the recorded experience of the profession is in support of that opinion.

It would seem that there has been a mixture of tradition and of a sort of superstition in the feeling with which this procedure has been generally regarded. If the dangers attributed to it were real, one would expect them to appear prominently in the histories cited. Yet, in fact, the proportion of absolute successes, so far as I can calculate them, is something over eighty per cent.; the failures about seven per cent., and the instances in which bad consequences were ascribed to the operation about eleven per cent. And looking at the cases in detail, it certainly seems to me that on all the counts of the indictment, danger of peritonitis, danger of infiltration of urine and urinary abscess, danger of urinary fistula, a verdict at least of "not proven" might fairly be asked for.

But it may be said that the other side is not heard; that the statistics of operations through the perineum and through the rectum should be given, and a comparison instituted between them and those now presented. My answer to this must be, that I am not concerned to advocate one operation more than another. Finding the suprapubic operation easy, available in very grave cases, and attended with good results in my own trials of it; regretting that it had not been earlier known to me as a resource, and believing that it has not met with the degree of favor it deserves at the hands of either writers or practitioners, it occurred to me to gather the evidence in regard to it for your inspection. I would say that it seems to me to be adapted to cases of retention from difficult stricture, especially with false passages, with prevesical abscess, or from traumatic cause; to cases of rupture of the urethra; to those of enlarged prostate with irritability, of tumors or foreign bodies within the bladder, and in some instances of intravesical hemorrhage.

The suprapubic operation does not by any means, in any case, preclude the perineal, as is shown in a number of cases cited in this paper. On the contrary, it often prepares the way for it.

One question I would ask: If the suprapubic section had been first tried and generally adopted, is it likely that the perineal operation would have been afterward preferred on account of its greater ease, simplicity, or efficiency?

It is a matter of satisfaction to me that the suprapubic operation, and my attempt at its defence, are now submitted to judges whose knowledge and experience must insure impartiality in their decisions, and leniency in their criticism.

BIBLIOGRAPHY.

- ABERNETHY. On Diseases of the Urethra. In Surgical Works. London, 1822.
 AMUSSAT. Leçons sur les Rétentions d'Urine, etc. Paris, 1832.
 ANGELOT. L'Union Médicale, April 18, 1874.
 BAKER. Lancet, April 17, 1886.
 BASEILHAC, PASCAL. De la Taille Latérale par le périnée, et celle de l'hypogastre, ou haut Appareil. Paris, 1804.

- BELL, SIR CHARLES. Treatise on the Diseases of the Urethra, etc. London, 1822.
- BELL, JOSEPH. Edinburgh Med. Journal, April, 1874.
- BENNETT. Lancet, Feb. 26, 1887.
- BETTON. Am. Journ. of the Med. Sciences, Feb. 1837.
- BRAINARD. Northwestern Med. and Surg. Journal, April, 1849.
- BRODIE, SIR B. C. Lectures on the Diseases of the Urinary Organs. London, 1832.
- BROWN. British Med. Journal, May 23, 1874.
- Lancet, March 25, 1848.
- BROWNE, G. BUCKSTON. Lancet, Feb. 26, 1887.
- BROWNE, J. W. Dublin Journal of the Med. Sciences, Feb. 1, 1887.
- BRYANT. Lancet, Feb. 26, 1887.
- Practice of Surgery, 2d Amer. ed. Philadelphia, 1879.
- CALHOUN. Atlanta Med. and Surg. Journal, March, 1872.
- CALLENDER. St. Bartholomew's Hosp. Reports, 1866.
- CAMPBELL. British Med. Journal, Feb. 21, 1880.
- CARPUE. A History of the High Operation for the Stone, etc. London, 1819.
- CAZENAVE. Bull. de la Soc. de Chirurgie de Paris, 1856.
- CHASSAIGNAC. Traité Clinique et Pratique des Opérations Chirurgicales, tome ii. p. 833.
- CHASSANIOL. L'Union Médicale, 1862.
- CHESTON. Med. Communications, vol. ii. London, 1790.
- CHIENE. Edinburgh Med. Journal, March, 1886.
- COOPER, SIR A. P. Lecture in the Lancet, March 14, 1823.
- DIONIS. Cours d'Opérations de Chirurgie, avec remarques, etc., par G. de la Faye. Paris, 1750.
- DORA. Med. and Surg. Reporter, Feb. 12, 1876.
- DORSEY. Elements of Surgery, vol. ii., 1813.
- DRAPER. British Med. Journal, Oct. 1, 1870.
- DROUINEAU. Revue de Chirurgie, Oct. 10, 1885.
- DUCAMP. On Retentions of Urine. Herbert's translation. London, 1827.
- ERICHSEN. The Science and Art of Surgery, 1885.
- FAIRBANKS. London Med. Record, March 15, 1887; from Bristol Med.-Chir. Journal,
- FEREDAY. Med.-Chir. Review, vol. ii., London, 1827.
- FOX. Northwestern Med. and Surg. Journal, March, 1856.
- FRANCO. Traité des Hernies, etc. Lyons, 1561.
- FRÈRE COME. Nouvelle Méthode d'extraire la pierre de la Vessie, etc., 1779.
- GASON. Lancet, Oct. 10, 1863.
- GAY. Boston Med. and Surg. Journal, March 28, 1878.
- GIBSON. Institutes and Practice of Surgery, vol. ii. Philadelphia, 1850.
- GISBORNE. Provincial Medical and Surgical Journal, 1850.

- GOULEY. *Diseases of the Urinary Organs*, 1873.
- GROSS, S. D. *Practical Treatise on the Diseases, Injuries, and Malformations of the Urinary Bladder, etc.* Philadelphia, 1876.
- GUTHRIE. *On the Anatomy and Diseases of the Neck of the Bladder and of the Urethra.* London, 1834.
- GUTHRIE. *Trans. Med. Soc. of the State of Pennsylvania*, 1874.
- HALL. *N. Y. Med. Record*, June 15, 1874.
- HAMILTON, F. H. *Principles and Practice of Surgery.* New York, 1872.
- HEISTER. *A General System of Surgery, etc.*, p. 238. English translation. 1768.
- HEYLAERTS. *Journal de Méd. de Chir. et de Pharmacie*, Brussels, 1844.
- HOME, SIR E. *Trans. of A Society for the Improvement of Medical and Chirurgical Knowledge*, vol. ii., London, 1800.
- HOWSE. *Med. Press and Circular*, London, Oct. 30, 1878.
- . *Trans. of Clin. Society of London*, vol. xii., 1879.
- HOWSHIP. *Practical Observations on the Diseases of the Urinary Organs.* London, 1816.
- HULKE. *Lancet*, April 16, 1870.
- . *Trans. of Clin. Society of London*, vol. xii., 1879.
- HUMPHRY. *Lancet*, Feb. 26, 1887.
- HUNTER. *Works*, edited by Palmer. London, 1835-37.
- HYATT. *North Carolina Med. Journal*, Dec. 1883.
- JACOBSON. *British Med. Journal*, Oct. 23, 1886.
- KAPTEIJN. *Lancet*, July 4, 1885 (leading article).
- KONIG. *London Med. Record*, Aug. 16, 1886.
- LACROIX. *Bull. Gén. de Thérap.*, 1856.
- LA GARDE. *N. Y. Med. Record*, Aug. 28, 1875.
- LOOMIS. *N. Y. Med. Record*, Aug. 1, 1873.
- LUCAS, JAMES. *London Med. Journal*, 1790, Part II.
- MACILWAIN. *Lancet*, July 29, 1843.
- MACKIE. *Boston Med. and Surg. Journal*, Oct. 31, 1867.
- MALGAIGNE. *Révue Méd.-Chir. de Paris*, March, 1854.
- MALHERBE. *Charleston Med. and Surg. Journal*, Jan. 1876.
- MANSON. *Stethoscope and Virginia Med. Gaz.*, June, 1851.
- MARSH. *Lancet*, May 8, 1880.
- MAUND. *Med. Times and Gazette*, Sept. 11, 1852.
- MIXON. *American Practitioner*, Feb. 1875.
- MONOD. *Bull. de la Soc. de Chirurgie de Paris*, 1851.
- MÜNCHMEYER. *Monatsschr. für Geburtsk. und Frauenkrankh.* Berlin, 1859.
- NOEL. *Journal de Chirurgie (Desault)*, 1791-92.
- . *Journal de Méd., Chir. et Pharmacie*, 1793.
- NORMAN. *British Med. Journal*, June 4, 1859.
- NORTON. *Lancet*, May 22, 1880.
- OLIVER. *Lancet*, Dec. 16, 1837.

- OWEN. *The Surgical Diseases of Children.* London, 1885.
- PAGET, T. *Ranking's Abstract*, 1859.
- PARRISH. *Practical Observations on Strangulated Hernia, and some of the Diseases of the Urinary Organs.* Philada., 1836.
- PEIXOTO. *Revista Medica* (Rio de Janeiro), 1877. (Reference in the Index Catalogue of Library S. G. O.)
- PETIT, J. L. *Oeuvres Posthumes*, tome iii.
- PHILLIPS. *A Treatise on the Urethra, etc.* London, 1832.
- PITTS. *Lancet*, Dec. 4, 1886.
- PORCHER. *Charleston Med. Journal and Review*, July, 1876.
- RANKE. *Med. Times and Gaz.*, Sept. 30, 1876.
- ROSE. *Lancet*, Feb. 14, 1874.
- RUTHERFORD. *Canada Med. and Surg. Journal*, Nov. 1885.
- SÉGALAS. *Traité des Rétentions d'Urine*, Paris, 1828.
- SEWALL. *N. Y. Med. Record*, Nov. 1, 1872.
- SEXTON. *Med. Repertory*, Cincinnati, Oct. 1871.
- SHARP. *Critical Inquiry into the Present State of Surgery*, 4th ed. London, 1761.
- SHEILD. *The Practitioner*, June, 1886.
- SHEPHERD. *Clinic* (Cincinnati), March 24, 1877.
- SLOAN. *Glasgow Med. Journal*, 1859.
- SMITH, J. GREIG. *British Med. Journal*, June 19, 1886.
- SMITH, THOMAS. *St. Bartholomew's Hosp. Reports*, 1881.
- SOUTHAM. *British Med. Journal*, May 22, 1886 (leading article); *Ibid.*, Oct. 16, 1886.
- SPEIR. *N. Y. Med. Record*, Feb. 16, 1874.
- SPENCE. *Lectures on Surgery*, 3d ed., 1882.
- STEIN. *A Study of Tumors of the Bladder.* New York, 1881.
- STEVENS. *Indian Med. Gazette*, 1872.
- STYLL. *Virginia Med. Monthly*, May, 1879.
- SYME. *Lancet*, March 11, 1848.
- TAYLOR, H. *Lancet*, Feb. 14, 1874.
- TAYLOR, R. N. *American Med. Weekly*, Dec. 4, 1875.
- TEEVAN. *Lancet*, April 7, 1880.
- THISTLE. *Lancet*, Oct. 17, 1885.
- THOMAS. *Lancet*, Aug. 21, 1886.
- THOMPSON, SIR H. *Diseases of Urinary Organs.* London, 1883.
- TOLET. *Traité de la Lithotomie*, 1708.
- TOOGOOD. *Provincial Med. Journal*, Nov. 6, 1841.
- TREMAINE. *Lancet*, April 10, 1886.
- TREVES. *Lancet*, Sept. 4, 1880.
- . *Lancet*, June 19, 1886.
- TURNER, DANIEL. *The Art of Surgery*, vol. ii. 2d ed. London, 1725.
- TURNER, FRANCIS. *London Med. Journal*, 1790, Part I.

- VAN BUREN. Am. Med. Monthly, July, 1856.
VANDERVEER. Trans. Med. Soc. of New Jersey, 1878.
VISE. London Med. Repository, Feb. 1, 1814.
VOLKMANN. Med. Times and Gaz., July 15, 1876 (leading article).
VON ANTAL. Verhandl. d. Deutschen Gesellsch. für Chirurgie. Berlin, 1885.
WADDELL. Stethoscope and Virginia Med. Gaz., Sept. 1854.
WAKLEY. Lancet, Nov. 23, 1850.
WELDON. Observations on the Different Modes of Puncturing the Bladder in Cases of Retention of Urine. London, 1793.
WHITEHEAD. Trans. of Colorado Terr. Med. Soc., 1874.
WHITTAKER. Clinic (Cincinnati), Aug. 30, 1873.
WICK. Cincinnati Lancet and Clinic, July 6, 1878.
WILE. British Med. Journal, Nov. 13, 1886.
WILLIAMS. N. Y. Medical Times, Jan. 1855.

